

Application No. 10/721,133
Response dated Aug. 2, 2005
Reply to Office Action mailed May 2, 2005

REMARKS

Claims 1-3 are pending. By this Response, claim 1 has been amended. Applicants respectfully submit that the amendment does not add any new matter to the present application.

In the Office Action, the Examiner:
rejected claims 1-3 as being anticipated under 35 USC § 102(e) by US Patent No. 6,851,258 to Kawashima et. al.; and
rejected claims 1-3 as being anticipated under 35 USC § 102(e) by US Patent No. 6,378,297 to Ito et al.

The Examiner rejected claims 1-3 as being anticipated by Kawashima. Applicants disagree. Applicants submit that Kawashima is not prior art under 35 USC § 102(e). Kawashima is entitled to a § 102(e) prior art date of June 3, 2003. The filing date of the priority Japanese application (2002-189206) is irrelevant to the determination of the § 102(e) prior art date of Kawashima. The present application, on the other hand, is entitled to at least the priority date of November 28, 2002, the filing date of the Japanese application (2002-345644) from which foreign priority benefits are claimed, for a date of invention. Applicants respectfully request that the Examiner withdraw this rejection and forbear from relying on Kawashima as a prior art reference under § 102(e).

The Examiner also rejected claims 1-3 as being anticipated by Ito. The Examiner asserts that Ito discloses that the control means increases the amount of the fuel injection from the amount of the basic fuel injection in order to compensate for a drop in a torque output of the internal combustion engine which is caused by retarding the timing of the fuel injection. Applicants disagree.

Ito discloses an exhaust gas purification system. Specifically, Ito teaches fuel injection timing retardation optionally combined with additional, auxiliary fuel injections to achieve a desired exhaust gas temperature rise. Ito fails to disclose an increase in the amount of fuel injected. Ito further fails to disclose

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increasing the amount of fuel injected to compensate for a drop in torque due to timing retardation or to maintain a desired torque level.

Amended claim 1 recites, among other things, that the control means *increases the amount of the fuel injection from the amount of the basic fuel injection* in order to compensate for a drop in a torque output of the internal combustion engine which is caused by retarding the timing of the fuel injection when the detected or computed exhaust gas temperature is lower than the catalytic activation temperature of the exhaust purification device. Ito fails to disclose that the amount of fuel injection is increased from the amount of the basic fuel injection. Ito discloses a basic or ordinary fuel injection quantity "Q." Ito further discloses a retarded fuel injection quantity " Q_R " and auxiliary fuel injection quantities " Q_V " and " Q_P ," which quantities are injected at different timings in the cycle. Ito fails to disclose that the sum of the retarded and auxiliary fuel injection quantities ($Q_R + Q_V + Q_P$) exceeds the ordinary fuel injection quantity (Q). In fact, Ito never discloses or even discusses the relative amounts of the different fuel injection quantities (Q, Q_R , Q_V , Q_P) and it is entirely plausible that the total fuel quantity for the ordinary operating condition is the same as, or even more than, the total fuel quantity for the delayed operating conditions.

Although Ito discloses that "auxiliary fuel is injected in addition to the main fuel" (col. 7, l. 20), this does not necessarily mean that the overall quantity of injected fuel is increased over the basic fuel injection quantity Q. Rather, this merely refers to the fact that there are an additional number of injections during the combustion cycle. Further, when Ito discloses "if the auxiliary fuel Q_P is injected, the amount of fuel consumption is increased" (col. 7, ll. 13-15), Ito is comparing injection pattern IV to injection pattern III of Ito's FIG. 8. Thus, Ito's statement that "the amount of fuel consumption is increased" is not made with respect to the basic or ordinary fuel injection quantity Q. Rather, the amount of fuel consumption is increased with respect to $Q_V + Q_P$ and, as discussed above, Ito fails to disclose how the quantity of $Q_V + Q_P$ relates to the quantity of Q. Applicants submit that it is an exercise in hindsight to assume that Ito discloses an increase in the amount of the fuel injection from the amount of the basic

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fuel injection.

Amended claim 1 also recites that the control means increases the amount of the fuel injection from the amount of the basic fuel injection *in order to compensate for a drop in a torque output of the internal combustion engine which is caused by retarding the timing of the fuel injection*. Ito fails to disclose that a drop in torque output is caused by retarding the timing of the fuel injection. In fact, Ito discloses the opposite—the more the timing of the fuel injection is retarded, the greater the output torque. Specifically, Ito states that “As shown in FIG. 11, the injection start timing ΘS of the main fuel Q_R at this time is delayed until after top dead center of the compression stroke and is delayed more the higher the required torque TQ .” (Col. 7, ll. 64-67; see also col. 8, ll. 44-46.) Thus, since Ito teaches that there is no drop in torque, there is no teaching in Ito that any increase in the amount of fuel injection over the basic fuel injection amount would be required to compensate for any drop in torque due to delaying the timing of the fuel injection. Moreover, this teaching of Ito supports Applicants’ above-discussed assertion that it is improper to assume that Ito discloses an *increase* in the amount of the fuel injection from the amount of the basic fuel injection.

Amended claim 1 further recites that the control means increases the amount of the fuel injection from the amount of the basic fuel injection in order “... so that the torque output obtained is substantially equal to the torque output of the normal fuel injection timing”. This is important because one of the objectives of the present application is to mitigate the possibility of causing a driver to feel any driving discomfort, due to an unexpected reduced torque output, by increasing the amount of the fuel injection so that the torque output obtained is equal to the torque output of the normal fuel injection. In contrast, and as presented above, Ito fails to disclose a drop in torque output, and thus, Ito fails to disclose that the amount of fuel injection must be increased so as to obtain the torque output substantially equal to the torque output of the normal fuel injection timing.

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Amended claim 1 even further recites that the values of the increased amounts of the fuel injections are stored into the control means in the form of maps. The present application discloses that the "values of the increased amount of the fuel injection Qgain with which a torque output fluctuation is not generated when exhaust gas temperature rise control is performed, are prepared by testing beforehand under various operational conditions, and the increased fuel injection map M2 as shown in Figure 4 is prepared." (Para. [0053], last sentence.) Ito fails to disclose such a map.

For a reference to anticipate a claim, each and every element of the claim must be disclosed in the reference. As presented above, Ito fails to disclose each and every element of claim 1, and therefore, Ito fails to anticipate claim 1. Claims 2 and 3 depend from claim 1 and contain additional recitations thereto. For all of these reasons, Ito also fails to anticipate claims 2 and 3.

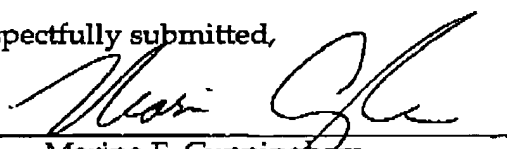
In view of the foregoing, it is respectfully submitted that claims 1-3 and the present application are in condition for allowance and action to that effect is earnestly solicited.

Should the Examiner have any questions regarding the present application, Applicants respectfully request that the Examiner contact Applicants' representative at the phone number listed below.

Although Applicants do not believe a fee is due with the submission of this Response, if it is deemed that a fee is required, please charge to Deposit Account 13-0235.

Respectfully submitted,

By


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